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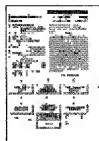
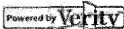
View: INPADOC | Jump to: Go to: [Derwent](#) [Email this to a friend](#)Title: **JP2000048987A2: DISCHARGE LAMP LIGHTING DEVICE AND LIGHTING SYSTEM**Derwent Title: Discharge lamp starter, has control circuit which uniformly controls lighting condition based on source voltage, when lamp is soft starting ([Derwent Record](#))Country: **JP** JapanKind: **A2** Document Laid open to Public inspection ¹Inventor: **MATSUMOTO SHINICHIRO;**
MITA KAZUTOSHI;Assignee: **TOSHIBA LIGHTING & TECHNOLOGY CORP**
[News, Profiles, Stocks and More about this company](#)Published / Filed: **2000-02-18 / 1998-07-27**Application Number: **JP1998000211551**IPC Code: Advanced: **H05B 41/24**;
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IPC-7: **H05B 41/24**;Priority Number: **1998-07-27 JP1998000211551**

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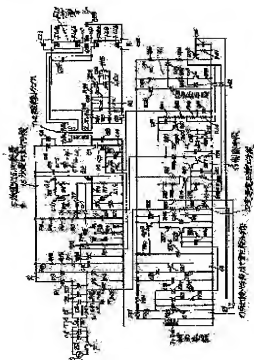
(54) DISCHARGE LAMP LIGHTING DEVICE AND LIGHTING SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To impress an appropriate voltage to a discharge lamp even at the time of soft-starting.

SOLUTION: Fluorescent lamps FL1, FL2 are preheated for about one second after power source feed in a condition that an output of an inverter circuit 15 is slightly low, to be soft-started. A power source voltage is monitored based on a transistor Q14, an output voltage of the inverter circuit 15 is made constant by feedforward control, and a gate voltage of an electric field-effect transistor Q2 keeps constant an output of the inverter circuit 15 coping with a wide range of the power source voltage to preheat the fluorescent lamps FL1, FL2.

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CLAIMS

[Claim(s)]

[Claim 1] The electric-discharge lamp lighting device characterized by providing the control means which controls the output of a electric-discharge lamp lighting means uniformly corresponding to the supply voltage detected with the supply voltage detection means when carrying out the soft start of the; discharge lamp to a electric-discharge lamp lighting means to make a discharge lamp turn on corresponding to two or more supply voltage, and a supply voltage detection means to detect; supply voltage, and;

[Claim 2] The electric-discharge lamp lighting device characterized by providing the control means which controls the output of a electric-discharge lamp lighting means uniformly corresponding to the output voltage of the electric-discharge lamp lighting means detected with the output voltage detection means when carrying out the soft start of the; discharge lamp to a electric-discharge lamp lighting means to make a discharge lamp turn on corresponding to two or more supply voltage, and an output voltage detection means to detect the output voltage of; electric-discharge lamp lighting means, and;

[Claim 3] The electric-discharge lamp lighting device characterized by providing the control means which the amplification factor of inversed amplification will be changed and will control a electric-discharge lamp lighting means if lighting is detected by the amplification factor adjustable inversed amplification and; lighting detection means which detect a electric-discharge lamp lighting means to make a discharge lamp turn on, a lighting detection means to detect lighting of; discharge lamp, and; supply voltage, and carry out reversal magnification, and;

[Claim 4] It has an isolation transformer, there is no lighting detection means of one claim characterized by detecting lighting according to the electrical potential difference by which has auxiliary winding magnetically connected to the isolation transformer, and induction is carried out to this auxiliary winding, and a electric-discharge lamp lighting means is the electric-discharge lamp lighting device of a publication 3 either.

[Claim 5] claim 1 thru/ or 4 -- either -- the electric-discharge lamp lighting device of a publication, and; -
- the lighting system characterized by providing the body of an instrument with which the discharge lamp turned on by this electric-discharge lamp lighting device is attached, and;

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the electric-discharge lamp lighting device and lighting system which turn on a discharge lamp.

[0002]

[Description of the Prior Art] Conventionally, the thing which makes a discharge lamp turn on like 200V and 242V as this kind of a electric-discharge lamp lighting device corresponding to two or more supply voltage for example is known.

[0003] the early stage of the discharge lamp according to a cold start in case this electric-discharge lamp lighting device also makes a discharge lamp turn on -- in order to prevent melanism, the soft start which heats the filament of a discharge lamp beforehand using a little low output voltage is carried out, after that comparatively high output voltage is generated, and the discharge lamp is made to turn on

[0004]

[Problem(s) to be Solved by the Invention] However, if the voltage variation of a soft start is large and the electrical potential difference at the time of a soft start is high in case it is made to correspond to different supply voltage in the above-mentioned conventional electric-discharge lamp lighting device, a cold start will be carried out and a discharge lamp will carry out early melanism, and on the contrary, if the electrical potential difference at the time of a soft start is low, it has the problem which becomes insufficient [a preheating] and carries out early melanism similarly.

[0005] This invention was made in view of the above-mentioned trouble, and aims at offering the electric-discharge lamp lighting device and lighting system which can impress an electrical potential difference suitable also at the time of a soft start to a discharge lamp.

[0006]

[Means for Solving the Problem] A electric-discharge lamp lighting device according to claim 1 It corresponds to the supply voltage detected with the supply voltage detection means when carrying out the soft start of the; discharge lamp to a electric-discharge lamp lighting means to make a discharge lamp turn on corresponding to two or more supply voltage, and a supply voltage detection means to detect; supply voltage. It is a thing possessing the control means which controls the output of a electric-discharge lamp lighting means uniformly. In order that a control means may carry out adjustable [of the output of a electric-discharge lamp lighting means] by feedforward control based on the electrical potential difference which detected supply voltage with the supply voltage detection means, and was detected with this supply voltage detection means, The output of a electric-discharge lamp lighting means is fixed also at the time of a soft start, and a discharge lamp carries out a cold start, or prevents becoming insufficient [a preheating].

[0007] A electric-discharge lamp lighting device according to claim 2 It corresponds to two or more supply voltage. It corresponds to the output voltage of the electric-discharge lamp lighting means detected with the output voltage detection means when carrying out the soft start of the; discharge lamp to a electric-discharge lamp lighting means to make a discharge lamp turn on, and an output voltage

detection means to detect the output voltage of; electric-discharge lamp lighting means. It is a thing possessing the control means which controls the output of a electric-discharge lamp lighting means uniformly. In order that a control means may carry out adjustable [of the output of a electric-discharge lamp lighting means] by feedback control based on the electrical potential difference which detected the output voltage of a electric-discharge lamp lighting means with the output voltage detection means, and was detected with this supply voltage detection means, The output of a electric-discharge lamp lighting means is fixed also at the time of a soft start, and a discharge lamp carries out a cold start, or prevents becoming insufficient [a preheating].

[0008] A electric-discharge lamp lighting device according to claim 3 A discharge lamp It is a thing possessing the control means which the amplification factor of inversed amplification will be changed and will control a electric-discharge lamp lighting means if lighting is detected by the amplification factor adjustable inversed amplification and; lighting detection means which detect the electric-discharge lamp lighting means made to turn on, a lighting detection means to detect lighting of; discharge lamp, and; supply voltage, and carry out reversal magnification. By a electric-discharge lamp lighting means' detecting lighting of a discharge lamp, and changing the detection ratio of inversed amplification in front of lighting of a discharge lamp, and in the back, the preheating of a discharge lamp is made suitable, and a discharge lamp carries out a cold start, or prevents becoming insufficient [a preheating].

[0009] The electrical potential difference of the auxiliary winding which a electric-discharge lamp lighting means has an isolation transformer in the electric-discharge lamp lighting device of a publication, a electric-discharge lamp lighting device according to claim 4 has claim 1 thru/or auxiliary winding by which the lighting detection means was magnetically connected to the isolation transformer, detects lighting according to the electrical potential difference by which induction is carried out to this auxiliary winding 3 either, and was magnetically connected to the isolation transformer detects lighting of a discharge lamp simply by corresponding to the electrical potential difference of a discharge lamp.

[0010] a lighting system according to claim 5 -- claim 1 thru/or 4 -- either -- the electric-discharge lamp lighting device of a publication, and; -- it is a thing possessing the body of an instrument with which the discharge lamp turned on by this electric-discharge lamp lighting device is attached, and each operation is done so.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of 1 operation of the lighting system of this invention is explained with reference to a drawing.

[0012] As drawing 2 is the perspective view showing the appearance of a lighting system and it is shown in drawing 2 , a lighting system 1 has the body 2 of an instrument. Reflectors 3 and 3 are formed in the inferior surface of tongue of this body 2 of an instrument, and lamp sockets 4 and 4 are attached in the both ends of these reflectors 3. Between these lamp sockets 4 and 4, they are fluorescent lamp floor line1 as a discharge lamp, and floor line2, respectively. It is attached electrically and mechanically and the electric-discharge lamp lighting device 5 shown in drawing 1 is attached in the interior of the body 2 of an instrument.

[0013] As drawing 1 is the circuit diagram showing a electric-discharge lamp lighting device and it is shown in this drawing 1 , as for the electric-discharge lamp lighting device 5, a filter circuit 11 is connected to the about [270V] commercial alternating current power source e through Fuse F from supply voltage 180V. This filter circuit 11 has the constant-voltage component Z1, a capacitor C1, a transformer Tr1, an inductor L1, a capacitor C2, the capacitor C3, the capacitor C4, the constant-voltage component Z2, the constant-voltage component Z3, etc., and is connected to the full wave rectifier circuit 12. This full wave rectifier circuit 12 consists of diode bridges where bridge connection of diode D1, diode D2, diode D3, and the diode D4 was carried out.

[0014] Moreover, the inverter circuit 15 of the half bridge type as a electric-discharge lamp lighting means is connected to this full wave rectifier circuit 12. While the low field-effect transistor Q1 and low field-effect transistor Q2 of withstand voltage of or less [withstand voltage 600] V extent as a switching means are connected to a serial between the output terminals of a full wave rectifier circuit 12,

as for this inverter circuit 15, the parallel circuit of a capacitor C5 and a capacitor C6, the series circuit of the capacitor C7 for power factor improvement and a field-effect transistor Q3, and the parallel circuit of a capacitor C8 are connected to the serial. Furthermore, the node of a field-effect transistor Q1 and a field-effect transistor Q2, Between the nodes of a capacitor C5, a capacitor C6, a capacitor C7, and a capacitor C8 good saturation current transformer CT 1 the inductor L2 which carries out corrugating and improves a power-factor by forming a combination circuit and making a RF superimpose with input coil CT1a, a capacitor C7, and a capacitor C8 -- and Inverter transformer Tr2 which is an isolation transformer Primary-winding Tr2a is connected to the serial. Moreover, the capacitor C9 is connected to juxtaposition to the field-effect transistor Q1.

[0015] furthermore -- the output side of a full wave rectifier circuit 12 -- resistance R1, resistance R2, resistance R3, and capacitor C11 a series circuit connects -- having -- resistance R3 and capacitor C11 The node is connected through diode D5 and resistance R4 at the node of a field-effect transistor Q1 and a field-effect transistor Q2. Moreover, between the gate of a field-effect transistor Q1, and the source, they are resistance R5 and the good saturation current transformer CT 1. The series circuit of output-winding CT1b and resistance R6 are connected to juxtaposition. Moreover, resistance R3 and a capacitor C11 A node is connected to the gate of a field-effect transistor Q2 through the trigger device Q5 for the triggers of a field-effect transistor Q2, and resistance R7, and it is the good saturation current transformer CT 1 between the gate of this field-effect transistor Q2, and the source. The series circuit of output-winding CT1c and resistance R8 and resistance R9 are connected to juxtaposition. Furthermore, it is zener diode ZD1 to juxtaposition to output-winding CT1c of the good saturation current transformer CT 1. And zener diode ZD2 The series circuit is connected to juxtaposition.

[0016] Moreover, resistance R11, resistance R12, resistance R13, diode D6, and a capacitor C12 are similarly connected to juxtaposition at the output side of a full wave rectifier circuit 12. A series circuit is connected and it is a capacitor C12. It receives and is zener diode ZD3 to juxtaposition. Resistance R14 And resistance R15 A series circuit is connected to juxtaposition and it is this resistance R15. It receives and is a capacitor C13 to juxtaposition. Furthermore, resistance R14 And resistance R15 It connects with the gate of a field-effect transistor Q6 at a node, and the drain of this field-effect transistor Q6 is connected to the gate of a field-effect transistor Q2 through diode D7. Moreover, diode D6 and a capacitor C12 A node is resistance R16. It minds, connects with the gate of a field-effect transistor Q3, and is resistance R17 between the gate of this field-effect transistor Q3, and the source. Capacitor C14 The series circuit of diode D7 and a transistor Q7 is connected to juxtaposition.

[0017] On the other hand, it is the inverter transformer Tr2. Secondary-winding Tr2b Fluorescent lamp floor line1 Capacitor C15 for the direct-current cut of the end of filament floor line1a, and the end-of-life detector 16 as an end-of-life detection means It minds and is fluorescent lamp floor line2. It connects between the ends of filament floor line2b. Fluorescent lamp floor line1 Filament floor line1b and fluorescent lamp floor line2 Filament floor line2a is connected and it is fluorescent lamp floor line1. And fluorescent lamp floor line2 It connects with the serial. Moreover, fluorescent lamp floor line1 Among the both ends of filament floor line1a, it is a capacitor C21. It connects. Fluorescent lamp floor line2 Among the both ends of filament floor line2a, it is a capacitor C22. It connects. Fluorescent lamp floor line1 The other end and fluorescent lamp floor line2 of filament floor line1a Capacitor C23 for starting in between the other ends of filament floor line2b It connects. Fluorescent lamp floor line1 The end and fluorescent lamp floor line2 of filament floor line1a Between the ends of filament floor line2a, it is a capacitor C24. It connects. Fluorescent lamp floor line1 The other end and fluorescent lamp floor line2 of filament floor line1b Between the other ends of filament floor line2a, it is a capacitor C25. It connects. Moreover, capacitor C25 Resistance R18 And it connects between the gate of a field-effect transistor Q6, and the source through diode D8. And inverter transformer Tr2 Filament preheating coil Tr2c is fluorescent lamp floor line1. Filament floor line1b and fluorescent lamp floor line2 It connects with filament floor line2a.

[0018] Moreover, capacitor C15 Resistance R21 And resistance R22 Series circuit, Diode D11 And diode D12 A series circuit is connected to juxtaposition and they are these resistance R21. And resistance R22 Node, Diode D11 And diode D12 Between nodes, it is a capacitor C27. It connects. This

capacitor C27 Resistance R23 It connects with juxtaposition and is resistance R23. Resistance R24, Zener diode ZD4 It reaches, the series circuit of light emitting diode LED1 is connected to juxtaposition, and it is a capacitor C28 to light emitting diode LED1. And resistance R25 is connected to juxtaposition.

[0019] furthermore, inverter transformer Tr2 Auxiliary winding Tr2d of the lighting detector 17 which has a function as a lighting detection means and an electrical-potential-difference detection means is prepared. **** -- In auxiliary winding Tr2d, it is diode D31 to a serial. It connects and is resistance R31 to the series circuit of this auxiliary winding Tr2d and diode D31. And resistance R32 A series circuit is connected to juxtaposition. Resistance R32 Capacitor C31 Zener diode ZD5 which lamp voltage turns on more than by 350V And resistance R33 A series circuit is connected to juxtaposition and it is diode D31. And resistance R31 A node is resistance R34. It minds and connects with the time constant circuit 18. The base of a transistor Q11 is connected at the node of a capacitor C32, and the collector of this transistor Q11 and an emitter are connected to the both ends of a capacitor C32, and also by capacity with a small capacitor C33, this time constant circuit 18 is formed so that a time constant big enough can be taken. It has and is this capacitor C32. Capacitor C33 And resistance R35 A series circuit is connected and it is a capacitor C33. And resistance R35

[0020] moreover, the time constant circuit 18 -- resistance R36 of the control circuit 19 as a control means And zener diode ZD6 a series circuit connects -- having -- this resistance R36 and the node of zener diode ZD6 -- transistor Q12 it connects with the base -- having -- this transistor Q12 an emitter -- capacitor C32 an end -- a collector -- capacitor C34 minding -- capacitor C32 It connects with the other end. Furthermore, it connects at the node of a capacitor C34 and resistance R32. Resistance R37 And transistor Q13 A collector and an emitter are connected and it is this transistor Q13. Between the base and an emitter, it is resistance R38. And capacitor C35 A parallel circuit is connected and the base is resistance R39. And zener diode ZD7 with which lamp voltage maintains a reverse blocking state less than [400V] It minds and is resistance R31.

[0021] furthermore, the input side of a full wave rectifier circuit 12 -- the resistance R41 of the supply voltage detector 20 as a supply voltage detection means, resistance R42, resistance R43, resistance R44, and resistance R45 And resistance R46 a series circuit connects -- having -- resistance R45 And resistance R46 Capacitor C40 It connects with juxtaposition. Moreover, resistance R45 Transistor Q14 which constitutes inversed amplification The base is connected and it is this transistor Q14. An emitter is resistance R51. It minds and is resistance R34. While connecting Resistance R52 And diode D33 A series circuit is minded and it is a transistor Q12. It connects with a collector. Transistor Q14 A collector is a capacitor C36. And resistance R53 It connects with the negative-electrode side of a full wave rectifier circuit 12 through a parallel circuit. It is resistance R54 to resistance R53. And transistor Q15 The series circuit of an emitter and a collector is connected and it is this transistor Q15. The base is diode D34. While minding and connecting with the modulated light setting terminal 21 Resistance R55 It minds and is diode D32. It connects. Furthermore, transistor Q14 It is a transistor Q16 to a collector. The base is connected and it is this transistor Q16. A collector and an emitter are a transistor Q17. It connects with a collector and an emitter and is this transistor Q17. A collector is diode D36. It minds and is zener diode ZD1. And it connects at the node of resistance R8.

[0022] Moreover, capacitor C34 Resistance R61, resistance R62, and resistance R63 And resistance R64 A series circuit is connected to juxtaposition. Resistance R64 It receives and is a capacitor C41 to juxtaposition. It connects and is this capacitor C41. It connects with the base of a transistor Q7. Resistance R61 Capacitor C42 It connects with juxtaposition and is resistance R61. And resistance R62 A node is a transistor Q20. It connects with the base. Transistor Q20 A collector is resistance R65. It minds and is a transistor Q21. It connects with the base. This transistor Q21 A collector is connected to the negative electrode of a full wave rectifier circuit 12. This transistor Q21 It is a capacitor C43 between the base and an emitter. It connects. This transistor Q21 An emitter is a transistor Q22. It connects with the base. This transistor Q22 An emitter is zener diode ZD7. And diode D37 It minds and they are resistance R8 and zener diode ZD1. It connects at a node and is a transistor Q22. The collector is connected to the negative electrode of a full wave rectifier circuit 12.

[0023] Furthermore, capacitor C32 Resistance R65 and resistance R66 of the time constant circuit 22 as a time constant means And transistor Q23 The series circuit of a collector and an emitter is connected and it is this transistor Q23. It is resistance R67 to the base. And capacitor C45 The parallel circuit is connected. Moreover, transistor Q23 A collector is diode D41. It minds and is resistance R62. And resistance R63 While connecting, it is diode D42. It minds and is a transistor Q15. It connects with the base.

[0024] moreover, resistance R65 is connected. Capacitor C46 And diode D43 a series circuit connects with juxtaposition -- having -- capacitor C46 Resistance R68 It connects with juxtaposition -- having -- this resistance R68 **** -- resistance R69 And photo transistor Q24 by which photograph coupling was carried out to light emitting diode LED1 the series circuit of a collector and an emitter -- connecting -- this transistor Q24 Diode D44 Furthermore, resistance R68 And resistance R69 In a node, it is the programmable unijunction transistor (PUT) Q25 as an insurance means. The gate is connected and it is this programmable unijunction transistor Q25. An anode is zener diode ZD8. It minds and is resistance R34. It connects and the cathode is connected to the negative electrode of a full wave rectifier circuit 12.

[0025] Next, actuation of the gestalt of the above-mentioned implementation is explained.

[0026] First, through a filter circuit 11, full wave rectification of the alternating voltage of the commercial alternating current power source e is carried out in a full wave rectifier circuit 12, and it is supplied to an inverter circuit 15. At this inverter circuit 15, it is the good saturation current transformer CT 1. Based on the current detected by input coil CT1a, it is based on the electrical potential difference by which induction was carried out to output-winding CT1b and CT1c, and by turns, it turns on and off actuation of a field-effect transistor Q1 and the field-effect transistor Q2 is carried out.

[0027] And at the time of starting, it is a capacitor C33. Since it does not charge, it is a transistor Q11. Base current is supplied to the base and it is a transistor Q11. It turns on and is zener diode ZD6. Since a reverse blocking state is maintained Transistor Q12 It will be in an OFF state and is a transistor Q14. In an emitter, it is resistance R51. By a certain gain to which the Mika currents are supplied Transistor Q16 And transistor Q17 Since base current is in a comparatively low condition By making high gate voltage of a field-effect transistor Q2, it is the good saturation current transformer CT 1. Bring saturation forward, make an oscillation frequency high, and the ON state of a field-effect transistor Q2 is shortened. They are fluorescent lamp floor line1 and floor line2 in the condition that the output of an inverter circuit 15 is a little low for about 1 second. A preheating is carried out and a soft start is carried out. Supply voltage is supervised with the base of a transistor Q14 in this case. In addition, by feedforward control When an electrical potential difference falls, it is a transistor Q14. A collector and an emitter current increase. Transistor Q16 And transistor Q17 Base current becomes comparatively large. When the gate voltage of a field-effect transistor Q2 becomes low and an electrical potential difference increases on the contrary, it is a transistor Q14. Collector, An emitter current decreases and it is a transistor Q16. And transistor Q17 Base current becomes comparatively small. Corresponding to the supply voltage of the large range, the gate voltage of a field-effect transistor Q2 keeps the output of an inverter circuit 15 constant, and the preheating of fluorescent lamp floor line1 and the floor line2 is carried out. Fluorescent lamp floor line1 and floor line2 Early melanism is carried out by the cold start, or it prevents carrying out early melanism with the lack of a preheating.

[0028] In addition, it is good also as a configuration which carries out feedback control with the electrical potential difference by which induction is carried out to auxiliary winding Tr2d.

[0029] Then, capacitor C33 It charges and is a transistor Q11. If turned off Zener diode ZD6 It turns on and is a transistor Q12. Since the base is set to a low level, it is a transistor Q12. It turns on and they are fluorescent lamp floor line1 and floor line2 at this time. By secondary voltage having occurred among both ends, since the electrical-potential-difference value is high Induction of the comparatively high electrical potential difference is carried out to auxiliary winding Tr2d, and it is zener diode ZD7. It turns on. Transistor Q14 In an emitter, it is resistance R51. The Mika currents are supplied, the output of an inverter circuit 15 increases a little, and they are fluorescent lamp floor line1 and floor line2 in a condition as it is. It is made to start.

[0030] Moreover, when lamp voltage becomes less than [400V], they are fluorescent lamp floor line1 and floor line2. It is judged that the light was switched on. Fluorescent lamp floor line1 and floor line2 The electrical potential difference between both ends becomes low, and the electrical potential difference by which induction is carried out to auxiliary winding Tr2d also falls. zener diode ZD7 a reverse blocking state -- becoming -- transistor Q14 an emitter -- resistance R51 And resistance R52 It becomes different gain from the time of the soft start to which a current is supplied. from -- The output of an inverter circuit 15 becomes low and is fluorescent lamp floor line1 and floor line2. The light is made to switch on.

[0031] Furthermore, sometimes, it is usually a transistor Q14. When supply voltage is supervised with the base and an electrical potential difference falls, it is a transistor Q14. A collector and an emitter current increase and it is a transistor Q16. And transistor Q17 Base current becomes comparatively large, the gate voltage of a field-effect transistor Q2 becomes low, and it is the good saturation current transformer CT 1. A lighting frequency becomes low because saturation becomes slow. On the contrary, when an electrical potential difference increases, it is a transistor Q14. A collector and an emitter current decrease and it is a transistor Q16. And transistor Q17 Base current becomes comparatively small, the gate voltage of a field-effect transistor Q2 keeps the output of an inverter circuit 15 constant corresponding to the supply voltage of the large range, and fluorescent lamp floor line1 and floor line2 are made to turn on.

[0032] On the other hand, they are fluorescent lamp floor line1 and floor line2. In case the light is made to modulate, the modulated light setting terminal 21 is short-circuited, and it is a transistor Q15. It turns on and is a transistor Q16. And transistor Q17 Base current is made small, the output of an inverter circuit 15 is reduced, and they are fluorescent lamp floor line1 and floor line2. Modulated light lighting is carried out.

[0033] Moreover, when lamp voltage becomes more than 350V, they are fluorescent lamp floor line1 and floor line2. It is judged that the light was switched on, and the electrical potential difference rose in the end of life etc. or there was nothing. Capacitor C41 Do not charge but the base current of a transistor Q7 is lost. A transistor Q7 turns off and gate voltage is impressed to a field-effect transistor Q3. Turn on a field-effect transistor Q3 and a capacitor C7 is connected to juxtaposition to a capacitor C8. Fluorescent lamp floor line1 and floor line2 The power-factor at the time of the light load which has not been turned on is improved, and it prevents that a high electrical potential difference is impressed to a field-effect transistor Q1 and a field-effect transistor Q2. In addition, detection of starting voltage is made into less than [400V], and they are fluorescent lamp floor line1 and floor line2. Hunting actuation is prevented by making detection of abnormalities more than 350V.

[0034] Furthermore, since the electrical potential difference by which induction is carried out to auxiliary winding Tr2d becomes high, it is zener diode ZD5. It turns on and is a transistor Q14. Base current is supplied and it is a transistor Q14. It turns on and is the capacitor C46 of the time constant circuit 22. When predetermined time progress is charged and carried out, it is the programmable unijunction transistor Q25. It turns on and zener diode ZD5 is also turned on. And zener diode ZD5 And programmable unijunction transistor Q25 If turned on, the power source of a control circuit 19 will fall and an inverter circuit 15 will fall an output. That is, a power source is dropped after the time amount set up in the time constant circuit 22 passes, in order to prevent malfunction.

[0035] In addition, fluorescent lamp floor line1 and floor line2 If a short circuit arises, the electrical potential difference by which induction is similarly carried out to auxiliary winding Tr2d will become high, the power source of a control circuit 19 will fall, and an inverter circuit 15 will fall an output.

[0036] Moreover, fluorescent lamp floor line1 and floor line2 When not equipped, it is a capacitor C25. The oscillation of an inverter circuit 15 is stopped by it being opened wide, gate voltage being impressed to a field-effect transistor Q6, and a field-effect transistor Q6 turning on, and losing the gate voltage of a field-effect transistor Q2, and not turning on a field-effect transistor Q2.

[0037] Furthermore, fluorescent lamp floor line1 and floor line2 When the end of life comes and half wave discharge is carried out, sometimes, a lamp current is usually a capacitor C15 because of an alternating current. Mind, and although it flows Resistance R21 And resistance R22 It flows in a path

and is a capacitor C27. By charging Zener diode ZD4 When it turns on and light emitting diode LED1 emits light A transistor Q24 turns on and it is a capacitor C46. It charges and is the programmable unijunction transistor Q25. And zener diode ZD8 By turning on After the end of life is detected and predetermined time passes, the power source of a control circuit 19 is dropped and the output of an inverter circuit 15 is reduced.

[0038]

[Effect of the Invention] According to the electric-discharge lamp lighting device according to claim 1, since a control means carries out adjustable [of the output of a electric-discharge lamp lighting means] by feedforward control based on the electrical potential difference which detected supply voltage with the supply voltage detection means, and was detected with this supply voltage detection means, the output of a electric-discharge lamp lighting means is fixed also at the time of a soft start, and a discharge lamp can carry out a cold start, or can prevent becoming insufficient [a preheating].

[0039] According to the electric-discharge lamp lighting device according to claim 2, since a control means carries out adjustable [of the output of a electric-discharge lamp lighting means] by feedback control based on the electrical potential difference which detected the output voltage of a electric-discharge lamp lighting means with the output voltage detection means, and was detected with this supply voltage detection means, the output of a electric-discharge lamp lighting means is fixed also at the time of a soft start, and a discharge lamp can carry out a cold start, or can prevent becoming insufficient [a preheating].

[0040] According to the electric-discharge lamp lighting device according to claim 3, by a electric-discharge lamp lighting means' detecting lighting of a discharge lamp, and changing the detection ratio of inversed amplification in front of lighting of a discharge lamp, and in the back, the preheating of a discharge lamp is made suitable, and a discharge lamp can carry out a cold start, or can prevent becoming insufficient [a preheating].

[0041] According to the electric-discharge lamp lighting device according to claim 4, claim 1 thru/or the electrical potential difference of auxiliary winding which was magnetically connected to the isolation transformer in addition to the electric-discharge lamp lighting device of a publication 3 either can detect lighting of a discharge lamp easily by corresponding to the electrical potential difference of a discharge lamp.

[0042] Since the body of an instrument with which claim 1 thru/or the discharge lamp turned on by the electric-discharge lamp lighting device of a publication 4 either are attached was provided according to the lighting system according to claim 5, each effectiveness can be done so.

[Translation done.]

